mopolitan, continental, North American, West Indian, etc., while those of the second class are compared in detail with their nearest allies. His conclusions are (1) that the Avifauna of the Bahamas is strongly West Indian, and that this group of islands is entitled to rank as a fauna of the Antillean region, the endemic species having been derived from West Indian stock, with a slight intrusion from Florida; (2) that Cuba has been the source of the greater number of forms; (3) that while North American species occur numerously as migrants, they have not assisted in forming the resident avifauna; (4) that the avifauna is of comparatively recent origin; (5) that forms having a common ancestry, and which now occupy widely separated areas, may have become so differentiated as to resemble more each other than they do the original stock (*e.g.*, *Geothlypis beldingi* of Lower California as compared with the Bahama and Florida forms, with nearly parallel cases in the genera *Spindalis*, *Vireo*, and *Certhiola*); (6) that certain Bahaman forms, occupying contiguous islands, have become differentiated under practically the same climatic or physiographic conditions — in other words, simply through isolation; (7) that we may probably assume that some of these endemic forms owe their origin primarily to features of individual variation, which through isolation, and hence close interbreeding, have become permanent. Several of these important generalizations we do not remember to have seen previously stated. The paper is thus of unusual interest. — J. A. A.

Chapman on the Grackles of the Subgenus Quiscalus.* — This interesting discussion of a highly perplexing subject — the relationships of our Grackles — is the result of the study of a series of over eight hundred skins, largely of breeding males, from many widely separated localities. This series shows the breeding range of *æneus* to extend from Texas and Louisiana to Great Slave Lake, "and from the eastern slopes of the Rockies to the western slopes of the Alleghanies, while from Massachusetts to Nova Scotia it reaches the Atlantic seaboard; *Quiscalus quiscula aglæus* is typically represented from New Orleans to Charleston, and southward to the extreme point of the Florida peninsula; and *Quiscalus quiscula* breeds from the northern limit of the range of *aglæus* northward to the southern limit of the range of *æneus* in the lower Connecticut and Hudson River Valleys."

As a preliminary to the discussion of their relationships, a detailed description is given of the coloration of each form, especially of *quiscula*, of which lack of space unfortunately permits us to quote but little.

In *æneus*, throughout its range, aside from a trifling seasonal, and considerable sexual, difference in brilliancy, there is practically no variation in the colors of the plumage, except of the head and neck which in both

*A Preliminary Study of the Grackles of the Subgenus *Quiscalus*. By Frank M. Chapman. Bulletin American Museum of Natural History, Vol. IV, No. 1, Article I, Feb. 25, 1892, pp. 1–20; map.

æneus and *quiscula* seem to vary with the individual independently of the coloring of other parts. Of the plumage of the head and neck "there are three types of coloration with their various degrees of intergradation. Briefly, these are (1) the purple type with more or less bronzy reflections, this closely resembling the color of the same parts in *aglæus*; (2) the steel-green or bluish-green; and (3) the steel-blue or purplish blue, previously described, which occurs in about twenty-five per cent of the specimens examined."

"Omitting all reference to the color of the head, as too variable a character to be used in diagnosis, we may know *æneus* as a bird in which the back and under parts are metallic brassy, or olivaceous bronze without iridescent bars in any part of the plumage. *Quiscula* assumes three phases of coloration which merge into one another in the order named: first, the bottle-green; second, the bronze-purple; and third, the brassy bluish green. In each of these phases the feathers of the back and under parts are banded with iridescent bars of varying extent. *Quiscalus quiscula aglæus* represents the highest development of phase No. 1 of *quiscula*." The reader must not infer that all or nearly all specimens of *quiscula* agree at all typically with one or the other of these three 'phases.' For instance in a series of 51 from West Chester, Penn., only about half that number could be referred to either of them, the remainder being variously intermediate between them.

Mr. Chapman proceeds to consider the series (of breeding males) of *quiscula* in geographical sequence from the south northward, grouping them by States, and noting the numbers, actual and relative, in each group that can be referred to each 'phase' or are intermediate between them. The results are tabulated and show, for so limited a series (between three and four hundred), a fairly steady gradation from *aglæus* ('phase No. 1') toward *æneus*. His conclusions, as to the facts, are as follows: " (1) *Quiscalus æneus*, throughout a breeding range which extends from the Rio Grande Valley to British America and New Brunswick, varies in coloration only in that comparatively limited part of its habitat adjoining the area occupied by *Quiscalus quiscula*, with which, at least from Pennsylvania to Massachusetts, it completely intergrades. (2) *Quiscalus quiscula*, an extremely variable form, assumes three phases of coloration; the first reaches its extreme development at the southern limit of the bird's range where the third phase is unknown, while the third phase is most highly developed at the bird's northern limit, where the first phase is unknown. The second phase connects the first and third, and is rarely found at either extreme, but is most abundant near the centre of the bird's habitat where, it is to be noted, all three phases with their connectants, occur together. (3) The exact relationships of *quiscula* and *æneus* in the lower Mississippi Valley and northward along the Alleghanies to Pennsylvania are not at present known. (4) In the Alleghanies of Pennsylvania, in the Hudson Valley from Sing Sing to Troy, in eastern Long Island, in Connecticut, and in Massachusetts as far north as

Cambridge, *quiscula* and *æneus* completely intergrade. (5) This intergradation is in every instance accomplished through phase No. 3 of *quiscula*."

From his measurements Mr. Chapman concludes that "the differences in size, which exist between these three forms, are too slight to be of diagnostic value in individual cases, the range of variation in either form completely overlapping the average differences."

"*Quiscalus æneus* presents slight but regular increase in size northward .... On the whole it appears to be a somewhat smaller bird than *quiscula*, with perhaps a slightly longer tarsus."

"In *aglæus* and *quiscula*, in passing from the South northward we find about the same increase in size shown by *æneus*; the wing and tail become longer, the bill thicker, but the length of this member decreases; Florida specimens having an actually, as well as relatively, longer bill than northern specimens."

The author seeks an explanation of the intergradation from *æneus* into *quiscula*, and finds it, to his own satisfaction, by assuming that it is due to hybridity between two distinct species. That it is a case of geographical variation he considers impossible, for, he says, we know of no differences of environment between the regions inhabited by the two forms, sufficient to cause the differences between them, and he thinks further that it is contrary to known laws of geographical variation for a form to continue as constant as *æneus* throughout a wide area and then abruptly change into one as different as *quiscula*.

It appears almost as if he had overlooked what certainly seems to be the simplest explanation of the facts, — that it is a case of geographical intergradation between two subspecies, one, *aglæus*, inhabiting the peninsula of Florida and the adjacent coasts, the other, *æneus*, spread over a large area in the West and North; between them a gradual intergradation from one into the other, every step of which Mr. Chapman has shown us in his 'phases' 'No. 2' and 'No. 3' and the many specimens intermediate between them. From this point of view the greater part of the series he calls *quiscula* — all, indeed, that are usually called by that name — are to be considered as intermediates of varying degree between the two subspecies *aglæus* and *æneus*, each of which, within its own territory is as constant as a subspecies can be fairly expected to be.

If we resort to the theory of hybridity between *æneus* and *quiscula* which he is inclined to accept, our way is not without stumbling blocks. According to this view the *æneus* blood has mingled in the veins of *quiscula* to a greater or less degree the nearer or farther from the habitat of *æneus* the impure *quiscula* is bred. But why should this corruption of the *quiscula* stock have penetrated nearly the whole of the area the bird occupies, while the territory of *æneus* has not been invaded at all by the other? If hybridization had gone on to such an extent we should expect to see at least some traces of *quiscula* blood cropping out now and then through the wide range of country that *æneus* inhabits. But such mongrels do not appear. — C. F. B.